1:25-cv-11231

U.S. District Court for the District of Massachusetts

Association of American Universities et al.

Plaintiffs,

– v. –

National Science Foundation

Defendant.

BRIEF OF AMICUS CURIAE IN SUPPORT OF THE DEFENDANT

Amicus Curiae

Simon P. ALTIN

I. INTEREST OF AMICUS CURIAE

Amicus Curiae is an engineering professor who has pursued degrees, taught, and conducted research at several U.S. universities. He is the author of a book titled ***The Broken STEM: Reflections for Decision Makers, Educators, Students, and Their Families***, which he would like to respectfully bring to the attention of the parties in this case.

II. ARGUMENT

The remainder of this *Brief* consists of excerpts from ***The Broken STEM***, along with their respective section titles, that appear relevant to this case. Three dots within square brackets, i.e., [...], indicate that sentences or paragraphs have been omitted from the excerpt.

§ WHERE DOES US STAND?

National Debt: US national debt totals $36.217 trillion or $106,000 for every single person in the country[1]. In $1 bills, this amount could cover the state of Washington twice. [...] Of this debt, around 70% is intergovernmental, while 30% is held by foreign countries: Japan ($1.1 trillion), China ($0.75 trillion), UK ($0.69 trillion) etc.

To attract lenders, the government must offer higher interest rates on its bonds, increasing borrowing costs for businesses and individuals. This can divert investments in the private sector and hinder job creation. Excessive government borrowing can lead to higher inflation, as the government may print more money to service the debt, devaluing the dollar. A high debt level can also restrict the government's ability to respond to economic crises, as more of the budget is allocated to debt payments. A large national debt may erode the confidence of international investors in the US economy. [...]

Trade Deficit: The United States has consistently run a trade deficit. The last time the US exported more than it imported was in 1975. [...] The fact that the US dollar is the main reserve currency of the world, is highly favorable to the US. Near 60% of all dollar bills is estimated to be circulating abroad, including over 80% of all 100 US banknotes.

High Tech Exports: Although US remains at the forefront of many technological developments, when it comes to high-tech exports US ranks fourth, behind *China*, *Germany* and *Hong Kong* (Table 2).

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[1]www.pgpf.org/national-debt-clock/

Table 2: High tech exports by country in billions (2021 data) South Korea and Singapore not included (source the United Nations and rankingroyals.com)

1	P.R. China	$942.31	11	Belgium	$52.23B
2	Hong Kong	$431.63	12	Czechia	$41.30
3	Germany	$209.74	13	Italy	$38.88
4	USA	$169.22	14	Philippines	$38.19
5	Japan	$116.51	15	Switzerland	$38.19
6	Malaysia	$108.68	16	Canada	$29.09
7	Netherlands	$101.17	17	India	$27.45
8	France	$97.53	18	Poland	$23.83
9	Mexico	$74.93	19	Spain	$23.46
10	UK	$66.70	20	Austria	$21.28

Technology Development: There are several indicators used to measure the technological development of a country, including: percentage of GDP allocated to R&D, number of researchers per million people, number of scientific and technical papers published annually, number of patents issued annually etc. (Figure 6).

Regarding patents, *China* surpassed US in patent applications in 2010, and reached over 1.4 million in 2021, which is more than half of the global total. In contrast, patent applications in the US have seen little growth in the last 15 years.

Since 2016, *China* has led the world in the number of scientific and technical papers. When adjusted for their population size, however, *Switzerland*, *Norway*, *Australia*, and *Canada* rank ahead of US.

In terms of R&D expenditure as a percentage of GDP, the US spent 3.46% in 2021. This is one percentage point more than *China* and comparable to *Sweden* (3.42%), *Switzerland* (3.36%), *Japan* (3.30%), and *Germany* (3.14%), but behind *Israel* (5.56%) and *South Korea* (4.93%). [...]

A legitimate question, similar to the case of healthcare, is how efficiently the federal R&D budget is spent?

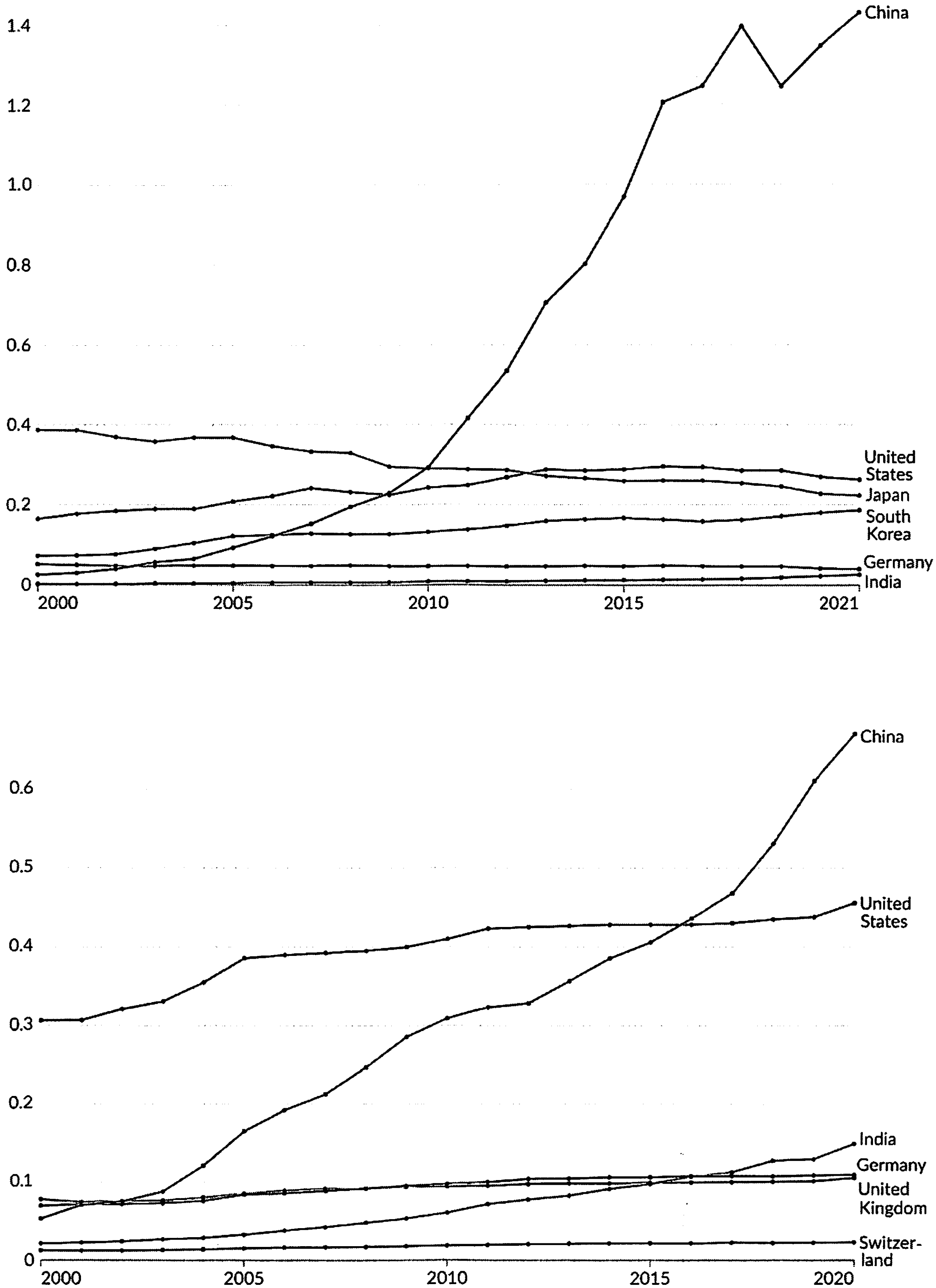

Figure 6: Scientific and technical articles (above) and patents by country (below) in millions (source ourworldindata.org)

§ ACADEMIA, A WORLD OF CONTRADICTIONS

US academia is driven by the pursuit of reputation, prestige, and, above all, money (Figure 7). The emphasis on reputation and prestige varies by the *league* in which each institution operates. Nevertheless, both are very important, as they influence student enrollment, the size and number of private donations, and the success rate in securing grants. In other words, reputation translates into money.

With money, administrators can pay themselves good salaries and bonuses, hire more staff, finance construction projects, and dedicate these projects when completed to fulfil their desire for a legacy. [...]

Governing is easy when money is in surplus because spending them does not require exceptional managerial skill, and wastefulness is not immediately apparent. However, when resources are scarce, governance becomes unpopular, as it may necessitate restructuring, eliminating positions, or freezing salaries, ultimately leading to employee dissatisfaction. Administrators fear unhappy subordinates because they can jeopardize their positions. For this reason, academic administrators strive to secure funding from any available source and prefer to keep their subordinates content and underworked, even if they may be underpaid.

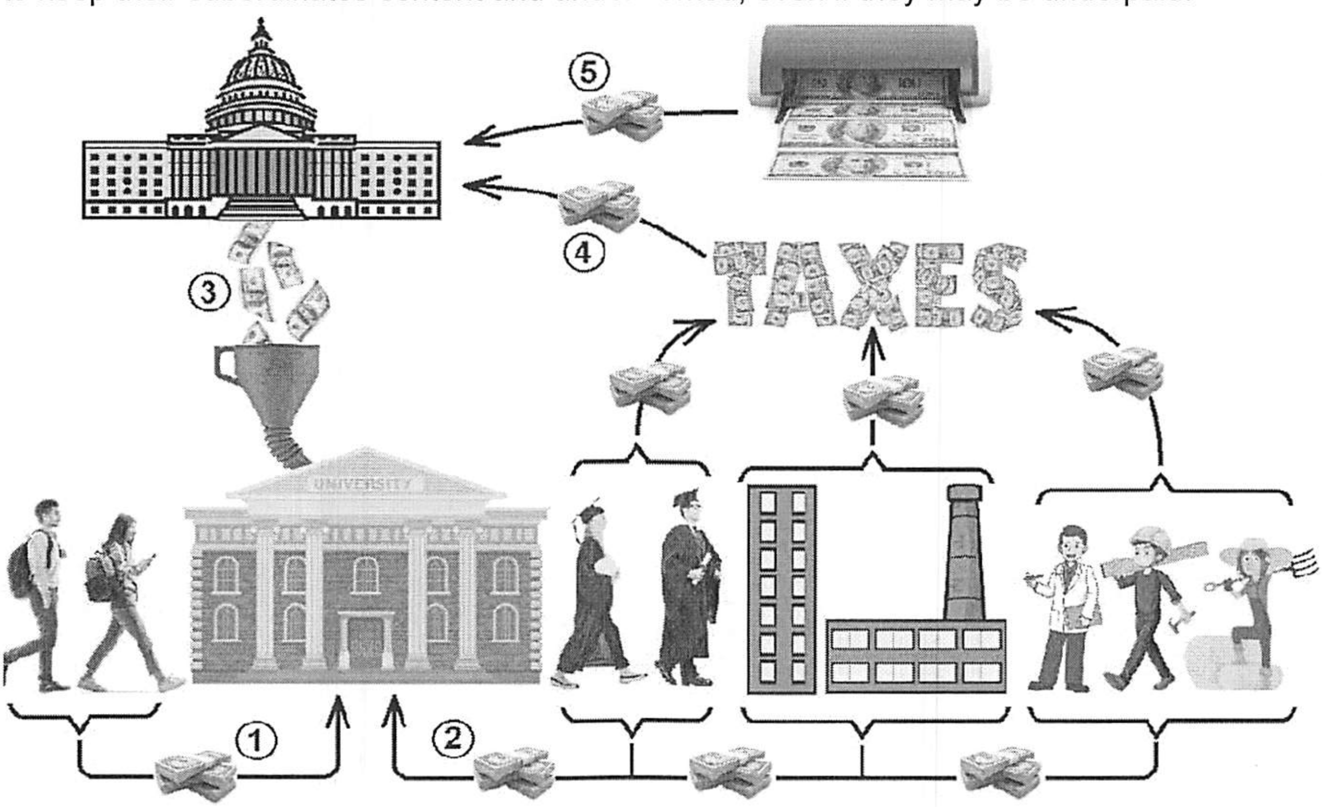

Figure 7: Universities and money circulation. (1) tuition, (2) direct donations, (3) federal, state and other public support, (4) & (5) source of money at (3).

☐ The rise of nonteaching staff in universities

It was argued that an ideal faculty-to-administrator ratio in colleges should be 3:1 for optimal efficiency. However, recent data shows a growing administrative workforce, close to 0.6 faculty per administrator[2]. [...] Scholars like Benjamin Ginsberg[3] and Richard K. Vedder[4] advocate restoring faculty prominence, arguing that excessive administration detracts from universities' core missions. [...] Internal institutional decisions, particularly administrative expansion, contributed twice as much to rising costs as factors such as inflation and reduced state support for public universities. Administrators are responsible for the increasing number of staff in universities. [...]

☐ Graduate students

Graduate students are individuals who have already earned a bachelor's degree and are pursuing advanced education. They enroll in graduate programs to obtain master's (M.S.) or doctoral (Ph.D.) degrees.

The salary of a graduate student in a STEM discipline can be in the form of teaching assistantships (TA), research assistantships (RA), or fellowships.

Graduate students working as TAs or RAs typically earn between $20,000 to $40,000 per year, depending on the university, the cost of living in the area, and the specific role. TAs are paid by the department to teach classes or grade papers, while RAs receive pay from ongoing grants.

Fellowships are typically awarded on a competitive basis, and can be from the university itself, or from government agencies like the National Science Foundation (NSF) or National Institutes of Health (NIH). Fellowship stipends may range from $25,000 to $45,000 per year, while highly competitive fellowships may provide higher stipends.

Graduate students can also do internships or co-op programs with companies and government labs (usually during summer), and supplement their income by $5000 or more per month.

It is common for the principal investigator (PI) on a grant to budget several weeks of summer salary for themselves, to supplement their nine-month base salary. Reviewing the numbers above (see "The Broken STEM"), it becomes immediately apparent that a graduate student's annual pay may very well be less than two months' salary of their adviser.

It is also well known that many graduate students in STEM fields are non-Americans[5].

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[2]Rogers J. (2012) 3 to 1: That's the Best Ratio of Tenure-Track Faculty to Administrators, Chronicle of Higher Education.

[3]Ginsberg B. (2011) The Fall of the Faculty, Oxford Univ. Press.

[4]Vedder R.K. (2019) Restoring the Promise: Higher Education in America, Independent Institute.

[5]Snyder A. (2024) Foreign-born STEM talent remains key to US research, Axios.

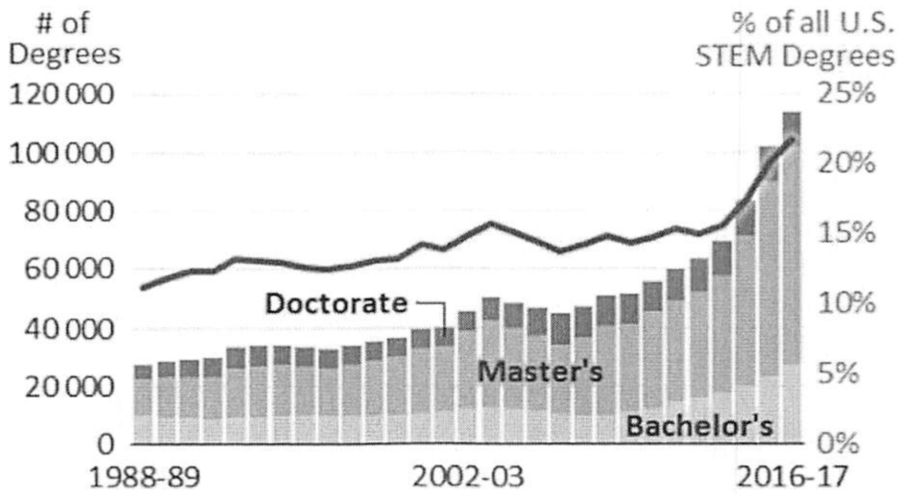

Figure 10: STEM degrees earned by foreign students (source: National Center for Education Statistics)

Table 3: Endowment values of the top 20 US universities in 2024 (in billions) and average annual tuition (in-state for public universities marked with *)

1	Harvard University	$51.98 B	$59,076
2	University of Texas System	$47.47 B	$11,678*
3	Yale University	$41.44 B	$64,700
4	Stanford University	$37.63 B	$67,731
5	Princeton University	$34.05 B	$59,710
6	MIT	$24.57 B	$60,156
7	Texas A&M University System	$20.38 B	$13,099*
8	University of Pennsylvania	$22.35 B	$66,104
9	University of Michigan	$19.17 B	$17,228*
10	University of California System	$19.10 B	$14,934*
11	University of Notre Dame	$17.90 B	$67,100
12	Columbia University	$14.78 B	$69,045
13	Northwestern University	$14.21 B	$65,997
14	Johns Hopkins University	$13.06 B	$65,230
15	Washington Univ. in St. Louis	$11.98 B	$62,982
16	University of Virginia	$10.22 B	$20,986*
17	Duke University	$11.89 B	$65,805
18	Emory University	$11.04 B	$60,774
19	Cornell University	$10.66 B	$66,014
20	Vanderbilt University	$10.25 B	$61,618

Figure 10 shows the number and percentage of STEM degrees earned by foreign students studying at US universities. This aligns well with Table 1 (not included), which indicates that more than 50% of engineers, as well as computer scientists and mathematicians currently working in the US, are foreign-born.

☐ How are universities funded?

US universities rely on multiple revenue sources, with funding structures differing between public and private institutions. Tuition and fees serve as the primary income stream. Tuition varies by residency status, degree program, and institutional prestige. Private universities depend more on tuition due to the absence of state support, while public universities receive state government funding to subsidize in-state tuition. However, declining state appropriations have contributed to rising tuition costs.

Both private and public institutions secure federal funding for research and infrastructure by submitting proposals to agencies such as NSF, NIH, DOE, DARPA, and NASA. Engineering and medical schools, in particular, depend heavily on research grants, often partnering with corporations for R&D, technology commercialization, and startup incubation. [...]

Endowments (see Table 3) play a substantial role in university finances, with institutions like Harvard, Yale, and Stanford using investment income to fund scholarships, faculty, and research. These funds, built from donations by alumni, corporations, and philanthropists, are managed as permanent assets, where only a portion of the returns (4% - 5%) is spent to preserve long-term growth. Endowments may be restricted for specific uses, such as endowed chairs or scholarships, or remain unrestricted for general institutional needs. Market fluctuations affect earnings, impacting financial stability. It is ironic that the gross domestic product of half the world's countries is smaller than the endowment of Harvard University. Critics argue that universities often prioritize accumulating endowment wealth over using it to lower tuition or expand financial aid, sparking debates about whether taxation should be used to incentivize greater spending on students.

Additional revenue sources include services such as housing, dining, athletics, hospitals, and technology licensing. [...]

The heavy reliance on tuition and endowments has raised concerns about affordability and student debt, making sustainable funding strategies a continuing challenge for higher education.

☐ College and university ranking

University rankings are conducted at national and international levels, typically by magazines, newspapers, governments, or independent organizations. Programs, departments, and schools within universities can also be ranked individually. Some of the most influential global university rankings include those published by *Shanghai Ranking Consultancy* in China which produces the *Academic Ranking of World Universities* (ARWU), *Times Higher Education* (THE) and *Quacquarelli Symonds* (QS) in Britain, and SCImago Institutions Rankings (SIR) in Spain. In the US, *Forbes*, *US News & World Report*, *Washington Monthly*, and *The Wall Street Journal* publish national university rankings. Since 2014, the *National Academy of Inventors* (NAI) has been publishing an annual ranking of international universities, and since 2022, of US universities, based on the number of patents granted each calendar year[6].

Rankings consider various factors, including research and scholarly output, federal research funding received, selectivity in admissions, alumni success, student-to-faculty ratio, internationalization (measured by the number of international students and faculty or global collaborations), and reputation based on surveys of academics and employers. [...]

☐ Research

Academic research and athletics share several similarities. Both can generate revenue and contribute to the university's prestige. Similar to sports, in addition to the researchers themselves (the equivalent of athletes and their coaches), a significant support staff can be found on campus, working in offices such as *Research and Sponsored Programs*, *Research, Innovation and Commercialization*, etc. These offices are overseen by a Vice President for Research (equivalent to the athletic director), who on average across the US may earn $200,000 a year plus bonuses. The main difference is that sports are more easily understood by the public, while research is not, so research results can be better embellished.

One key distinction is that in sports, the focus is on points scored and performance, whereas in academic research, the emphasis is on money spent. In university press releases, the amount of grant money awarded is trumpeted most, and only occasionally is the actual research accomplished mentioned. This is explicable because, for any grant won, the university retains an Indirect Cost (IDC), also called *Facilities-and-Administrative Costs*, to cover

[6] https://academyofinventors.org/

expenses not directly associated with the funded research project.

For federal grants, research institutions negotiate individual rates with the government to compensate for such expenses, which differ from university to university. These rates are applied to the *Modified Total Direct Costs* (MTDC), which include [summer] salaries and benefits for the investigators, materials and supplies, services, travel, etc. However, it does not include categories like tuition, scholarships and fellowships for graduate students, equipment, and subcontracts over $25,000. For example, a 55% IDC rate (currently used by several highly ranked US universities) means that approximately 25% of the grant funding does not go to actual research[7]. Johns Hopkins, the University of California San Francisco, the University of Washington, the University of Pennsylvania, and the University of Michigan each receive over $500 million in federal grants per year, with at least $100 million going to the respective university as IDC for administrative expenses, facilities maintenance, building and equipment depreciation, libraries, etc.

For this reason, faculty position advertisements typically list, for successful candidates (before any expectations for teaching are mentioned), requirements such as[8]:

... have a proven record of, or exceptional promise for, developing a vibrant externally-funded research program, or

... develop internationally-renowned, externally and competitively-funded, independent research program, or

... show potential to aggressively leverage opportunities at federal and state levels, to develop and grow an impactful and sustainable research program.

While not explicit, most universities expect faculty to seek research funding from public sources, with very few advertisements mentioning collaboration with industry. It reminds me of an instance when I approached a colleague, a research professor, about a project with a local company. He refused on the spot, candidly telling me that he prefers federal grants because industry wants results—quickly and for less money—whereas with a federal grant, he can deliver what he wants at the pace stated in the grant proposal.

High-performing candidates may be easier to recruit and more productive at reputed

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[7]Mosley J. E. (2012). Keeping the lights on: How government funding concerns drive the advocacy agendas of nonprofit homeless service providers. Journal of public administration research and theory, 22(4), 841-866.

[8]HigherEdJobs - Jobs in Higher Education, www.higheredjobs.com

universities. However, faculty in small STEM programs at lower-ranked universities often struggle to secure external research grants. When they do obtain one, it can cause disruptions due to a lack of space or qualified instructors to cover courses no longer taught by the grant recipient (known as the principal investigator or PI), who typically receives release time to work on the promised research. Moreover, they may receive, in addition to a reduced teaching load, space to set up their labs, often taken from student instructional areas.

Figure 8 (not included) shows the common space outside the research lab of an engineering faculty member who was very good in securing federal research grants. Due to his success, he was allocated one student study room, one teaching lab, and two-thirds of a common space, which was later partitioned. I would describe him as a *state within a state*, as rules (including safety regulations) did not apply to him. Luckily, he missed most faculty meetings, because when he did attend, he hijacked the meeting with his interventions. Regarding teaching, he taught only one graduate class of 8–10 students per semester.

Another professor I know, also successful with grants, teaches only one graduate class per year. Figure 19 (not included) shows a portion of the syllabus for this class, revealing that he had no scheduled lectures for over a month.

Some universities conduct research sponsored by nonprofit organizations and private companies, with indirect cost (IDC) rates that can vary depending on the sponsor and location. For example, the on-campus IDC rate for commercially sponsored research at Johns Hopkins University is 72%, while for research conducted by university personnel at an off-campus facility, the IDC rate is to 39%. For federal sponsored research the same rates are 55% and 26% respectively.

Universities can also generate revenue by selling intellectual property (IP) developed by faculty as part of their job duties[9]. Patents from university laboratory discoveries can create significant revenue, with universities and inventors sharing the proceeds according to each institution's IP policy. In 2007, for example, universities earned $1.88 billion in IP royalties, with inventors receiving an estimated $650 million.

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[9]Benderly B.L. (2017) Who counts as an inventor? The answer could be worth millions, Science, Aug. 2.

☐ Unfunded research

The norm in research funding is for faculty to write proposals, secure funding, and hire graduate students and postdocs to carry out the work. Meanwhile, the principal investigator (PI) does coordination and grant administration.

Securing funding can be a slow process, as preparing a proposal is time-consuming, often requires resubmissions, and the likelihood of winning a federal grant is relatively low; it is known that fewer than 20% of NSF proposals are selected for funding. The success rate is even lower for early-career researchers or for proposals submitted from less reputed institutions.

As a young faculty member, I was told several times to leverage my startup funds to complete the research for my first grant proposal, and once I secured a grant, to use that money to do the research for the next one. This can be applied in perpetuity, or a restart in a new research field can be undertaken by conducting unfunded research or using internal funding provided by the university, which, in most cases, is ten times smaller for the same amount of work than an external grant.

As Gallup Jr. and Svare have noted[10], proposals accepted with low review scores may still yield high productivity and strong results, and vice versa, suggesting that a lottery system might work just as well in awarding grants.

Some faculty members engage in research and scholarly pursuits without external funding. This is often because their work requires little financial support, which is common in theoretical fields or computer science. Others pursue projects outside fashionable areas of research that do not attract major funding agencies.

Unfunded research allows faculty to respond quickly to new ideas without the administrative burdens imposed by grants and offers greater freedom to control the research direction with minimal constraints. Many faculty members invest personal time and resources, driven by passion and sheer curiosity. Although no formal studies exist to generalize this, I personally feel more rewarded and emotionally connected to research I have conducted myself—where I know all the details—than to work done by graduate students under my supervision. On more than one occasion, I have witnessed professors presenting their students' work at conferences or during lab tours, clearly unfamiliar with many of its subtleties and details.

Whether funded or not, research undeniably helps faculty stay engaged and up-to-date in their teaching. Still, as we have seen, teaching and research do not always coexist easily. The reputations that universities build and maintain through research are also essential in attracting prospective students. Many applicants choose a university or program based on its established reputation, which reflects on graduates and contributes to their career success—sometimes as

[10]Gallup G.G. & Svare B.B. (2016) Hijacked by an external funding mentality, Inside Higher Ed, 25.

much as, or even more than, the knowledge they acquire while in school.

☐ Research misconduct and fraud

Others before me have written about how much of the reported research is useless or incorrect, either due to negligence or fraud[11,12]. This is often driven by the pressure to publish, the expectation that funded research must yield favorable results, or the desire to improve grant-winning odds. There have also been cases of direct grant fraud, leading to university fines and jail time for perpetrators. [...]

☐ More on research

In this section, I will discuss cases of research-related "awkwardness" that I have personally witnessed, along with additional information on federally funded research.

For my first two years in the US, I was supported by a professor managing a multi-million-dollar grant to develop a zero-gravity experiment. This was a multi-sample, semi-autonomous experiment, assembled in two extensively engineered containers (each costing $100,000). It soon became apparent to me that the land-based experiments conducted in this professor's lab were entirely sufficient, and that their zero-gravity version provided little improvement in data. What struck me the most was that this professor told us, not just once, that the essential part of the experiment would not be performed due to the risk of sample feed jamming.

Around the same time, I helped a fellow graduate student take photographs of himself striking a cable with an impulse hammer. The cable was lying loose on a granite table, and vibrating it in this way made absolutely no sense. I was told the pictures were for a research report that they knew nobody would read.

At my first teaching job, I was assigned a senior faculty member as my mentor. Among other advice, he told me to use my startup funds to conduct the research needed for my first successful grant proposal, then use that grant to fund research for my next proposal, and so on.

At another institution where I was affiliated, two large rooms previously used for teaching were converted into a computer cluster space and a Cave Automatic Virtual Environment

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[11]Harris R. (2018) Rigor Mortis: How Sloppy Science Creates Worthless Cures, Crushes Hope, and Wastes Billions, Basic Books.

[12]Goodstein D. (2024) On Fact and Fraud: Cautionary Tales from the Front Lines of Science, Princeton Univ. Press.

(CAVE). Both saw little use, especially the CAVE, which was only turned on for visitor tours and open-house recruiting events.

Table 5: US Government funding for selected science and engineering research fields in 2016.

1	Biological Sciences	$14,840,000
2	Medical Sciences	$10,935,000
3	Other Engineering	$5,688,000
4	Computer Sciences and Mathematics	$3,863,000
5	Physics	$3,040,000
6	Aeronautical Engineering	$1,825,000
7	Metallurgy and Materials Engineering	$1,757,000
8	Chemistry	$968,000
9	Electrical Engineering	$883,000
10	Astronautical Engineering	$661,000
11	Civil Engineering	$458,000
12	Chemical Engineering	$375,000
13	Mechanical Engineering	$310,000

Elsewhere, I witnessed expensive equipment being purchased, some from overseas, only to remain unopened for years, with the crates occupying valuable teaching lab space. At the same institution, I observed that within a 300-foot radius, there were three optical tables in three different labs, each costing around $10,000. One would have sufficed if shared, but despite collaboration being preached to students, it rarely happens among faculty in academia.

Situations like the ones described above are quite common—and not only in academia. Grant funds (or any subsidies) must be spent as evidence that the work has been conducted in accordance with the approved proposal. It is also well known that review reports, which must be submitted periodically to the funding agency, often end up shelved without ever being read.

A few years ago, when I expressed concern that my grant partner was moving to a different university, an associate dean conveyed to me (albeit through body language rather than words) that I should simply report that his portion of the work had been completed. [...]

National Science Foundation (NSF) is a US Government agency that, in 2024, operated with a budget of $9.06 billion. That year, NSF received 46,500 proposals and awarded funding

to 12,900, resulting in a 24% funding rate. Apart from paying its staff salaries (about 1500 of them), NSF distributes grants for scientific research and education based on single-blind peer-reviewed proposals. If we assume that each proposal takes one month to prepare, this is equivalent to removing 46,500 / 9 = 5,166 faculty members from their nine-month academic responsibilities for that year. Furthermore, to ease the burden on its own staff, the NSF now requires grant proposals to budget for an external overseer who will review progress reports before they are submitted to NSF. [...]

☐ University industry collaboration

Table 5 shows for comparison, the US government funding for selected STEM fields as well as medicine[13]. Because some engineering disciplines receive relatively small amount of research fundings, many faculty members seek research opportunities outside their program's field, even outside engineering. [...] Bureaucratic red tape, complex IP negotiations, and high university overhead costs make partnerships less attractive to industry.

Table 6: Bachelor's degrees awarded in the US in 2023

Engineering Disciplines	Federal Funding	Undergraduate Enrolment
Metallurgical and Materials Engineering	$383,550,686	7,253
Nuclear Engineering	$84,127,830	1,735
Engr. Science and Engr. Physics	$123,972,500	2,689
Biomedical Engineering	$876,268,319	34,353
Biological and Agricultural Engr.	$60,190,935	5,167
Chemical Engineering	$467,413,833	42,454
Engineering Other and General	$955,463,753	104,051
Civil and Environmental Engineering	$558,836,839	61,622
Electrical, Computer Engr. and Computer Science	$1,700,218,641	195,972
Aerospace Engineering	$209,349,912	24,161
Architectural Engineering	$20,784,053	3,220
Industrial/Manuf./Systems Engineering	$138,797,108	21,889
Mechanical Engineering	$764,418,065	135,672
Mining and Petroleum Engineering	$18,988,733	4,291
Engineering Management	$4,031,874	2,100

[13]NSF, National Center for Science and Engineering Statistics, www.nsf.gov/statistics/fedfunds/

☐ Exorbitant privilege in academia

Reputed universities tend to receive significantly larger donations for their research centers and labs. Institutions like Harvard, Stanford, and MIT are globally recognized for their excellence in education and research, and their high-profile alumni contribute substantial donations to support their alma maters. These universities also maintain influential networks that include successful entrepreneurs, philanthropists, and professionals in high-paying industries.

Such universities offer impactful research opportunities and have the infrastructure needed to support high-quality projects, making them highly attractive to private donors, foundations, and corporations. At these institutions, media visibility of faculty is just as important as academic publications, as it enhances the university's prestige and strengthens alumni engagement, which, in turn, drives further donations.

Winning federal grants is likewise easier due to their established track record of successful research. These institutions have built trust with funding agencies by consistently producing high-quality, impactful work. They attract top-tier faculty and researchers skilled in writing competitive grant proposals and meeting the expectations of funding agencies. Dedicated grant offices and support teams help identify opportunities, refine proposals, and ensure compliance with application requirements, increasing the likelihood of success.

Reputed universities are frequently involved in national and international research collaborations, which provide additional funding opportunities. They also have access to extensive resources, including past successful proposals, professional proposal writers, and training programs that strengthen grant applications.

Funding agencies often prefer institutions with a proven track record, viewing them as more reliable due to their established infrastructure and research history. Well-connected faculty within the academic community further enhance the institution's credibility, leading to more favorable proposal reviews.

For similar but opposite reasons, less established universities face significant challenges in securing both grants and donations. At some of these institutions, winning grants can even lead to "grant indigestion," pushing certain researchers and administrators toward unethical behavior.

☐ Similarities between academia and healthcare

There are striking similarities between academia and healthcare in the US when viewed through these analogies. [...] In both academia and healthcare, institutions must strategically milk funding agencies or insurance companies to stay financially viable. Researchers spend significant effort crafting grant proposals to secure funding, just as hospitals and doctors navigate insurance billing systems to maximize reimbursement. In both cases, success depends not just on merit but on understanding the bureaucracy and playing the game effectively.

The US invests heavily in both research and healthcare, yet its efficiency in terms of output is suboptimal. Despite massive research funding, the US is not the most productive country in research output per capita, just as its healthcare system spends more per capita than any other nation without achieving the best health outcomes. In both fields, there is an issue of inefficiency, where money does not directly translate to the best results.

Both academia and healthcare operate in systems where access to essential resources is unevenly distributed. They are heavily bureaucratic, requiring professionals to spend considerable time navigating funding mechanisms instead of focusing solely on research or patient care. Meanwhile, institutions and intermediaries (publishers, insurance companies, grant agencies) exert control over resources, often prioritizing financial incentives over genuine intellectual progress or the well-being of students and patients. [...]

☐ Similarities between academia and Communism

In both academia and communist enterprises, there can be a lack of accountability for the quality of the end product. In communist economies, inefficiencies in production and low-quality output were subsidized by the state, which prevented any real consequences for underperformance. Similarly, in academia, there can be little accountability for student outcomes, and universities may not always measure or prioritize the preparedness of students for the workforce. The centralization of resources in both systems can lead to a disconnection between the actual quality of work and the incentives that drive the system. [14,15]

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[14]Bok D. (2003) Universities in the Marketplace: The Commercialization of Higher Education, Princeton Univ. Press.

[15]Rouse W.B. (2016) Universities as Complex Enterprises: How Academia Works, Why It Works These Ways, and Where the University Enterprise is Headed, John Wiley & Sons Inc.

In academia, much of the revenue from student tuition is used to fund university operations, administrative overheads, research ambitions, and various other projects, many of which may not directly benefit students or improve their education. This mirrors the way centralized budgets in communist economies were often diverted toward projects that may not have been efficient or productive. Just as communist enterprises could prioritize political goals over economic efficiency, universities may prioritize expansion or prestige at the expense of student training.

In communist enterprises, inefficiencies were hidden by simply adding more workers, leading to an increase in the workforce without necessarily increasing productivity. Similarly, in academia, universities expand their administrative staff without necessarily improving the quality of their operations.

More employees can be a way to avoid addressing underlying issues and can result in bureaucratic inefficiency. The concept of *bullshit jobs*, popularized by David Graeber (1961-2020), refers to roles that contribute little to the actual goals of the organization[16]. In academia, this can manifest as roles in administration or certain research positions that may be funded but do not directly contribute to the mission of the university. These positions often exist to maintain the bureaucratic machinery rather than to fulfill a specific, meaningful purpose. [...]

III. CONCLUSIONS

The excerpts from the book ***The Broken STEM: Reflections for Decision Makers, Educators, Students and Their Families*** deemed most relevant to the arguments presented in this case have been included. The entire book is available on Amazon for free with *Kindle Unlimited* (ISBN: 979-8875858369 Amazon ASIN: B0CTKRVXB4).

Respectfully submitted

Simon P. Altin

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Dated: June 10, 2025

[16]Graeber D. (2018) Bullshit Jobs: A Theory, Simon & Schuster, New York.

CERTIFICATE OF SERVICE

I certify that I submitted the foregoing via mail to the Clerk of Court of the U.S. District Court for the District of Massachusetts.

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